

BACTERIOLOGY PROFICIENCY TESTING PROGRAM

General Category

September 21, 2004

This report summarizes the results of the proficiency test administered September 21, 2004 to laboratories in the General Bacteriology category.

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Bacteriology Proficiency Testing Program

GENERAL INFORMATION

The Bacteriology Proficiency Testing Program. Three proficiency testing events are given annually, each consisting of a minimum of five specimens. In order to successfully complete a test event, participating laboratories must achieve a score of 80% or greater. Failure of the testing program is defined as a score of less than 80% on two of three consecutive test events.

Authentication. The presence and identity of the organism(s) in each specimen must be confirmed by at least 80% of the referee or participating laboratories. Referee laboratories are selected from New York State participating laboratories (located throughout the State) with acceptable and reproducible levels of performance. Sample vials are subjected to extensive quality control testing in our laboratory during preparation and storage.

Grading System. Laboratories are to process proficiency test specimens in the same manner as patient specimens. Thus, laboratories are responsible for identifying test isolates to the same level as performed on patient isolates. If your laboratory speciates an organism on special request, then you must also speciate it in the proficiency test; consider speciation to have been requested on all reportable isolates. In addition, laboratories are not responsible for culturing any test samples from specimen sources which they do not process. Information regarding your laboratory's reporting protocol was provided to us in the questionnaire previously distributed to all laboratories. Any changes in reporting protocol must be received by our office prior to the mailout date for proficiency testing for that information to be considered in grading.

Our testing format is in compliance with HCFA guidelines as specified in the regulations of CLIA '88. One-half of our samples require identification of all organisms present. The other half requires that only the pathogenic organism(s) be reported. We recognize the potential for any organism to be pathogenic depending on the clinical condition of the patient. However, our samples are designed so that only well-established pathogens should be reported.

Tests are graded in strict adherence to HCFA guidelines, as specified in the regulations of CLIA '88. Each of the specimens receives a score as determined by the following formula:

$$(a + b)/(c + d + e) \times 100\%$$

a = # correct identifications

b = # correct antibiotic susceptibility results (if applicable)

c = # possible identifications

d = # possible antibiotic susceptibility results (if applicable)

e = # additional organisms reported

Grades for each sample are then averaged to determine the final grade for this testing event. The minimum passing grade for each test event is 80%.

Disclaimer

The use of brand and/or trade names in this report does not constitute an endorsement of the products on the part of the Wadsworth Center or the New York State Department of Health.

Notes of Interest

The association known as the National Committee for Clinical Laboratory Standards (NCCLS) will change its name to the Clinical and Laboratory Standards Institute, effective January 2005. The organization hopes to better reflect the full scope of its mission with the new name. See <http://enews.nccls.org/nccls/issues/2004-08-04/> for more information.

SEPTEMBER 21, 2004 TEST EVENT

Number of Participating Laboratories:

Receiving specimens 246
Returning results 246 (100%)

Grade Distribution		
Score	Number	Percent
100	184	74.8
90 - 99	28	11.4
80 - 89	20	8.1
70 - 79	6	2.4
60 - 69	1	0.4
< 60	7	2.8

REFEREE LABORATORY RESULTS

Specimen Number	Referee Laboratory Responses	Percent*
1	<i>Shigella sonnei</i>	100
2	Group A <i>Streptococcus</i>	100
3	<i>Bacteroides thetaiotaomicron</i>	80
	<i>Bacteroides ovatus/thetaiotaomicron</i>	10
	<i>Bacteroides caccae</i>	10
	<i>Arcanobacterium haemolyticum</i>	100
4	<i>Staphylococcus aureus</i>	100
5	<i>Vibrio vulnificus</i>	100

* Based on responses of 10 referee laboratories

Specimen Number 1 - Stool (Pathogens Only)

This simulated stool specimen contained *Shigella sonnei*. This pathogen was identified by all referee laboratories and by 91% of the participating laboratories that process stool specimens. An additional 6% of participating laboratories identified the organism to the genus level only, reporting '*Shigella species*'.

Serratia liquefaciens and *Escherichia coli* were included in this specimen as nonpathogenic flora.

Methods of identification used by laboratories reporting:

Shigella sonnei

bioMerieux Vitek GNI+	53
Dade Behring MicroScan Gram Neg ID	48
Two or more methods	36
bioMerieux API 20E	35
bioMerieux Vitek ID-GNB	14
bioMerieux Vitek GNI	11
Conventional biochemicals	5
BBL Crystal Enteric/Nonfermenter	3
Dade Behring MicroScan Rapid Gram Neg	3
Test method not indicated	2
BBL Enterotube II	1
Remel RapID ONE	1
TOTAL	212

Shigella species

Dade Behring MicroScan Gram Neg ID	5
Vitek GNI+	3
bioMerieux API 20E	2
Two or more	2
BBL Crystal Enteric/Nonfermenter	1
bioMerieux Vitek GNI	1
bioMerieux Vitek ID-GNB	1
TOTAL	15

Do not process stool cultures 13

No enteric pathogens 4

Gram negative bacillus 1

Presumptive *Shigella species*

bioMerieux Vitek GNI+ 1

Specimen No. 2 – Throat (Pathogens Only)

This simulated throat culture contained Group A *Streptococcus*. All referee laboratories identified this organism as did 99.6% of participating laboratories that process throat cultures.

Methods of identification used by laboratories reporting:

Group A *Streptococcus*

Murex Streptex	50
Conventional biochemicals	48
BBL Streptocard	47
PathoDX Strep Grouping	33
Two or more methods	31
bioMerieux Vitek GPI	8
Dade Behring MicroScan Gram Pos ID	6
bioMerieux Vitek Slidex Strepto	4
Phadebact Streptococcus	3
The Binding Site Strep Grouping Kit	4
bioMerieux API 20 Strep	3
Test method not indicated	1
PML Microbiologicals Identicult AE	1
B-D Q Test Strip	1
Quidel Quick Vue + Strep	1
Remel PathoDx Strep A	1
TOTAL	242

Do not process throat cultures 3

Beta hemolytic *Streptococcus* not group A or B

Conventional biochemicals 1

Specimen No. 3 – Blood - Aerobic/Anaerobic (All Organisms)

This simulated blood culture contained *Bacteroides thetaiotaomicron* and *Arcanobacterium haemolyticum*.

B. thetaiotaomicron was reported by 80% of referee laboratories and by 78% of participating laboratories that identify anaerobic organisms from blood cultures. An additional 6% reported *Bacteroides fragilis* group while 5% reported *Bacteroides* species.

Arcanobacterium haemolyticum was reported by all referee laboratories and by 84% of participating laboratories that processed this specimen source.

Methods of identification used by laboratories reporting:

Bacteroides thetaiotaomicron

Remel RapID ANA II	97
bioMerieux Vitek ANI	21
bioMerieux API 20A	19
Dade Behring MicroScan Rapid Anaerobe	15
Two or more methods	13
Conventional biochemicals	5
BBL Crystal Anaerobe	4
bioMerieux API Rapid ID 32A	3
bioMerieux API An-Ident	2
Test method not indicated	1
16s rDNA sequencing	1
TOTAL	181

***Bacteroides fragilis* group**

Remel RapID ANA II	9
bioMerieux Vitek ANI	3
Conventional biochemicals	1
bioMerieux API 20A	1
TOTAL	14

***Bacteroides* species**

Remel RapID ANA II	5
bioMerieux API 20A	3
Conventional biochemicals	1
Two or more methods	1
bioMerieux Vitek ANI	1
bioMerieux API An-Ident	1
TOTAL	12

Do not process blood cultures 7

Do not perform anaerobic cultures	7
<i>B. ovatus/thetaiotamicron</i> bioMerieux API 20A	5
Anaerobic gram negative bacillus	3
<i>Bacteroides ovatus</i> bioMerieux API 20A	1
bioMerieux API Rapid ID 32A	1
Dade Behring MicroScan Rapid Anaerobe	1
TOTAL	3
<i>Bacteroides uniformis</i> Remel RapID ANA II	2
Two or more	1
TOTAL	3
<i>Bacteroides caccae</i> bioMerieux Vitek ANI	2
No Bifidobacterium	2
Not reported	2
<i>Bacteroides fragilis</i> Remel Rapid ANA II	1
<i>Bacteroides ovis</i> bioMerieux Vitek ANI	1
<i>Bacteroides species not fragilis</i> Dade Behring MicroScan Rapid Anaerobe	1
<i>Prevotella loeschii</i> Remel RapID ANA II	1
<i>Prevotella melaninogenica</i> Remel RapID ANA II	1

Methods of identification used by laboratories reporting:

Arcanobacterium haemolyticum

Conventional biochemicals	79
bioMerieux API Coryne	64
Two or more methods	19
Remel RapID CB Plus	18
bioMerieux Vitek ANI	13
bioMerieux Vitek GPI	3
Biolog MicroLog Gram positive	1
bioMerieux Vitek GNI+	1
Remel RapID ANA II	1
Test method not indicated	1
TOTAL	200

Arcanobacterium species

Conventional biochemicals	5
Two or more methods	2
Test method not indicated	1
TOTAL	8

Do not process blood cultures 7

Arcanobacterium pyogenes

Remel RapID CD Plus	2
BBL Crystal Rapid Gram Positive	1
Conventional biochemicals	1
Remel RapID ANA II	1
Two or more methods	1
TOTAL	6

Aerobic gram positive bacillus 5

Gram positive bacillus 5

Actinomyces pyogenes

Remel RapID ANA II	2
Two or more methods	2
TOTAL	4

Corynebacterium species

Conventional biochemicals	1
Test method not indicated	1
TOTAL	2

Not reported 2

Aerobic actinomycetes

Conventional biochemicals	1
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<i>Arachnia propionica</i>	
Conventional biochemicals	1
Branching gram positive bacillus	1
Coryneform gram positive bacillus	1
<i>Listeria species</i>	
Conventional biochemicals	1
Pleomorphic gram positive bacillus	1
<i>Streptococcus milleri</i> group	
Dade Behring MicroScan	1

Additional organisms reported in Specimen 3:

<i>Ralstonia pickettii</i>	1
<i>Serratia liquefaciens</i>	1
<i>Staphylococcus aureus</i>	1
<i>Staphylococcus auricularis</i>	1

Specimen No. 4 – Abscess (All Organisms) and Antibiotic Susceptibility

This simulated abscess specimen contained a pure culture of *Staphylococcus aureus*. All referee laboratories correctly identified this organism as did all participating laboratories that process abscess cultures.

Antibiotic susceptibility testing with oxacillin and vancomycin was indicated for this specimen. This sample contained a methicillin-resistant *Staphylococcus aureus* (MRSA) that was susceptible to vancomycin. All participating laboratories that performed susceptibility testing on this specimen correctly reported the isolate as resistant to oxacillin and susceptible to vancomycin.

Although this isolate of *S. aureus* was susceptible to vancomycin, laboratories must be aware of the possibility of vancomycin-resistant *Staphylococcus aureus* (VRSA) and limitations in the ability of many testing methods to detect vancomycin resistant or intermediate strains. There have been three confirmed cases of VRSA in the United States, all three of which were also MRSA. The first case occurred in Michigan in 2002, followed by a case in Pennsylvania later that year. The third case occurred in New York in March, 2004. After analysis of these cases, it was determined that vancomycin resistance in two of these isolates was not reliably detected by automated testing systems. In addition, disk diffusion testing is unable to detect strains which are intermediate to vancomycin (VISA). Reliable methods of testing include non-automated MIC methods (broth microdilution, agar dilution or agar-gradient diffusion) and the use of vancomycin screening agar (BHI agar containing 6 : g/ml of vancomycin), with a full 24-hour incubation period. The addition of vancomycin screening agar is recommended for all laboratories using automated or disk diffusion methods, especially if the isolate is MRSA. Fifty-one laboratories reported that they used vancomycin screen agar, with 44 of these incorporating the screen agar to supplement another testing method and 7 relying on the screen agar alone.

If an isolate of *S. aureus* is encountered which appears to demonstrate decreased susceptibility to vancomycin (MIC of ≥ 4 : g/ml or a zone diameter of ≤ 14 mm), laboratories should confirm the organism identification and purity and repeat the susceptibility test using a non-automated MIC method. If results are duplicated, laboratories should notify infection control, the physician, and the local and state health departments of a “possible VISA/VRSA” and submit the isolate to a reference laboratory for confirmation. Laboratories in New York State (outside of New York City) should contact the Bacteriology Laboratory of the New York State Health Department at (518) 474-4177 while those in the New York City Area should contact the New York City Health Department at (212) 447-6786.

CDC VISA/VRSA Laboratory Detection Fact Sheet. <http://www.cdc.gov/ncidod/hip/Lab/FactSheet/vrsa.htm>

CDC. *Staphylococcus aureus* resistant to vancomycin – United States, 2002. MMWR 2002; 51:565-7.

CDC. Vancomycin-resistant *Staphylococcus aureus* – Pennsylvania, 2002. MMWR 2002; 51:902.

CDC. Brief report: Vancomycin-resistant *Staphylococcus aureus* – New York, 2004. MMWR 2004; 53: 322-323.

National Committee for Clinical Laboratory Standards, 2004. Performance Standards for Antimicrobial Susceptibility Testing; Fourteenth Informational Supplement, M100-S14. National Committee for Clinical Laboratory Standards, Wayne, PA.

Methods of identification used by laboratories reporting:

Staphylococcus aureus

Murex Staphaurex	47
Dade Behring MicroScan	45
Conventional biochemicals	42
Two or more methods	41
BBL Staphyloslide	19
Remel BactiStaph	14
bioMerieux Vitek GPI	10
bioMerieux API Staph	3
Fisher SureVue Color Staph	3
Sanofi Diagnostics Pasteur Pastorex Staph Plus	3
Test method not indicated	3
bioMerieux Vitek Slidex Staph	2
Dade Behring MicroScan Rapid Gram Pos	2
Life Sign Staph Latex	2
The Binding Site Staph Latex	2
bioMerieux Vitek ID-GPC	1
Pro-Lab Diagnostics Prolex Staph Latex	1
TOTAL	240

Do not process abscess specimens 4

Coagulase positive *Staphylococcus*

Conventional biochemicals	1
Remel BactiStaph	1
TOTAL	2

Results of Antimicrobial Susceptibility testing - *S. aureus* with OXACILLIN

Result	Method	MIC (µg/ml)	Zone diam. (mm)	
Resistant (239)	bioMerieux Vitek (95)	2 (1)		
		≥4 (13)		
		>4 (4)		
		≥8 (65)		
		>8 (11)		
		Not indicated (1)		
	Dade Behring MicroScan (77)	≥2 (2)		
		>2 (66)		
		≥4 (2)		
		>4 (1)		
		Not indicated (6)		
	Disk diffusion (55)			0 (32)
				6 (18)
				7 (1)
				8 (2)
				<10 (1)
				19 (1)
	MIC (unspecified) (5)	≥4 (1)		
		>4 (1)		
		≥8 (1)		
		>8 (1)		
		64 (1)		
	AB Biodisk E-test (3)	24 (1)		
≥64 (1)				
>256 (1)				
Agar dilution (1)	>2 (1)			
Cathra Autoreader (1)	>6 (1)			
Oxacillin Screen Agar (1)	Not indicated			
Trek Sensititre (1)	≥16 (1)			
Do not process abscess cultures (4)				
Do not perform susceptibility testing on abscess specimens (2)				
Oxacillin not tested (1)				

Number of laboratories reporting each result indicated in ()

Results of Antimicrobial Susceptibility testing – S. aureus with VANCOMYCIN

Result	Method	MIC (µg/ml)	Zone diam. (mm)	
Susceptible (233)	bioMerieux Vitek (91)	<0.5 (6)		
		0.5 (1)		
		≤0.5 (39)		
		<1 (3)		
		≤1 (14)		
		1 (2)		
		≤2 (1)		
		2 (24)		
		Not indicated (1)		
	Dade Behring MicroScan (73)	<2 (31)		
		≤2 (34)		
		≤4 (2)		
		Not indicated (6)		
	Disk diffusion (49)			15 (3)
				16 (2)
				17 (3)
				18 (3)
				19 (3)
				20 (16)
				20.5 (1)
				21 (9)
				22 (5)
		23 (2)		
		26 (2)		
	Vanco Screen Agar (7)			
	AB Biodisk E-test (5)	1 (1)		
		1.5 (1)		
2 (3)				
MIC (unspecified) (4)	≤0.5 (1)			
	≤1 (1)			
	1 (1)			
	<2 (1)			
Trek Sensititre (2)	2 (2)			
Agar dilution (1)	≤2			
Cathra Autoreader (1)	≤6			
Vancomycin not tested (6)				
Do not process abscess cultures (4)				
Do not perform susceptibility testing on abscess specimens (2)				
No result reported (1)				

Number of laboratories reporting each result indicated in ()

Antibiotic Susceptibility Results - Participating & Referee Labs <i>Staphylococcus aureus</i>				
	Oxacillin		Vancomycin	
	Referee ^a	Participant ^b	Referee ^a	Participant ^b
Susceptible	0	0	10	223
Intermediate	0	0	0	0
Resistant	10	229	0	0
Not Tested ^c	0	1	0	6
Do not process source ^d	0	4	0	4
No result reported	0	0	0	1
Not performed on organism ^e	0	0	0	0
Not performed on source ^f	0	2	0	2
No susceptibility testing done ^g	0	0	0	0

^aReferee Laboratories (10 labs total)

^bOther Participating Laboratories (236 labs total)

^cAntibiotic not tested / reported for this organism

^dDo not process specimen source

^eDo not perform antimicrobial susceptibility testing on this organism

^fDo not perform susceptibility testing on specimen source

^gNo antimicrobial susceptibility testing performed

Specimen No. 5 – Wound (All Organisms)

This simulated wound specimen contained *Vibrio vulnificus*. All referee laboratories reported this organism as did 88% of participating laboratories that process wound cultures. An additional 5.7% of participating laboratories identified this organism to the genus level but did not provide a species identification.

Vibrio vulnificus can be found in warm saltwater throughout much of the world and is found in all coastal waters of the United States. Infections associated with this organism are seasonal in the United States, with most occurring between May and October. *Vibrio vulnificus* is most often associated with gastroenteritis caused by ingestion of raw or undercooked seafood. In individuals with underlying illness, consumption of contaminated seafood can lead to a severe condition known as “primary septicemia” in which the organisms enter the bloodstream causing septic shock. Wound infections can occur by exposure of open wounds to seawater or through handling of infected seafood. Mortality rates range from 50% in cases of primary septicemia to 24% in cases of wound infections, with no deaths related to cases of gastroenteritis.

CDC. Division of Bacterial and Mycotic Diseases Disease Information – *Vibrio vulnificus*.
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm

US Food and Drug Administration. Center for Food Safety & Applied Nutrition. Foodborne Pathogenic Microorganisms and Natural Toxins Handbook. <http://www.cfsan.fda.gov/~mow/chap10.html>

Methods of identification used by laboratories reporting:

Vibrio vulnificus

Two or more methods	53
bioMerieux Vitek GNI+	48
bioMerieux API 20E	44
Dade Behring MicroScan Gram Negative	23
bioMerieux Vitek GNI	11
bioMerieux Vitek ID-GNB	10
bioMerieux API 20NE	9
Conventional biochemicals	4
Remel RapID NF Plus	4
BBL Crystal Enteric/Nonfermenter	3
bioMerieux API Rapid 20E	2
Dade Behring MicroScan Rapid Gram Negative	1
Test method not indicated	1
TOTAL	213

<i>Vibrio</i> species	
Two or more methods	4
bioMerieux Vitek GNI+	3
bioMerieux API 20E	2
bioMerieux API 20NE	2
Dade Behring MicroScan Gram Negative	2
Test method not indicated	1
TOTAL	14
Gram negative bacillus	5
Do not process wound cultures	4
No growth	3
<i>Aeromonas hydrophila</i>	
Remel RapID NF Plus	2
No pathogens	1
<i>Pasteurella multocida</i>	
Conventional biochemicals	1
<i>Vibrio fluvialis</i>	
Two or more methods	1
<i>Vibrio fluvialis/furnissii</i>	
Remel RapID NF Plus	1
<i>Vibrio mimicus</i>	
Two or more methods	1
 Additional organisms reported in Specimen 5:	
<i>Staphylococcus aureus</i>	1
<i>Streptococcus pyogenes</i>	1

Educational – Urine (All Organisms)

This simulated urine culture contained *Aerococcus urinae*. Approximately 43% of the participating laboratories that processed this sample correctly identified this organism. An additional 12% correctly identified it to the genus level, reporting ‘*Aerococcus* species’. Common misidentifications included *Aerococcus viridans* (6%), various *Gemella* species (10%), and alpha-hemolytic *Streptococcus* (12%). Surprisingly, more than 60% of the laboratories that reported this organism as an alpha-hemolytic *Streptococcus* had indicated on their Bacteriology Questionnaire that they would identify *Aerococcus* sp. from urine specimens.

The genus *Aerococcus* consists of catalase-negative, facultatively anaerobic gram-positive cocci which gram stain as clusters or tetrads. *Aerococcus urinae* was first described in 1967 and at that time was referred to as an ‘*Aerococcus*-like organism’. Initially, the genus *Aerococcus* contained the sole species, *A. viridans*, but in 1992 *A. urinae* was recognized as the second species within this genus. Subsequently, 3 additional species (*A. christensenii*, *A. urinaehominis*, and *A. sanguinicola*) have been described.

Aerococcus urinae is most often implicated in cases of urinary tract infection but has also been isolated from cases of endocarditis, urosepticemia and soft tissue infection. To date, 11 cases of *A. urinae* endocarditis have been documented in the literature with a mortality rate of 64%. In 6 of these 11 cases, it appeared that the urinary tract was the focus of infection. Typically, patients with *A. urinae* endocarditis are male (82%), greater than 65 years old (73%) and have preexisting urinary tract abnormalities (45%). Four of the eleven patients (36%) had predisposing factors such as diabetes mellitus, ischemic heart disease and cancer. *A. urinae* isolates have demonstrated susceptibility to penicillin, amoxicillin, piperacillin, cefepime, vancomycin and rifampicin, but are reportedly resistant to sulfonamides and aminoglycosides.

Aerococcus urinae isolates are alpha-hemolytic, will grow in 6.5% NaCl, and exhibit negative PYR and positive LAP reactions. Tables are included on the following pages to aid in the distinction of Aerococi from other catalase-negative gram-positive cocci and differentiation of species within the genus *Aerococcus*.

Ebnother, C, Altwegg, M, Gottschalk, J, Seebach, J D, and Kronenberg, A. 2002. *Aerococcus urinae* endocarditis: case report and review of the literature. *Infection* 30:310-313.

Facklam, R, Lovgren, M, Shewmaker, P L, and Tyrrell, G. 2003. Phenotypic description and antimicrobial susceptibilities of *Aerococcus sanguinicola* isolates from human clinical samples. *J Clin Microbiol* 41:2587-2592.

Schuur, P M, Sabbe, L, van der Wouw, A J, Montagne, G J, and Buiting, A G. 1999. Three cases of serious infection caused by *Aerococcus urinae*. *Eur J Clin Microbiol Infect Dis* 18:368-371.

Differentiation of *Aerococcus urinae* from other catalase-negative gram-positive cocci reported by participating laboratories

	Gram stain morphology	LAP	PYR	6.5 % NaCl	Alpha hemolysis	Vancomycin Susceptibility	Bile esculin
<i>Aerococcus urinae</i>	clusters	+	-	+	+	S	-
<i>Aerococcus viridans</i>	clusters	-	+	+	+	S	V
<i>Gemella haemolysans</i>	clusters	-	+	-	-	S	-
<i>Gemella morbillorum</i>	chains	+	+	-	-	S	-
<i>Lactococcus</i> sp.	chains	+	-	V	V	S	+
<i>Leuconostoc</i> sp.	chains	-	-	+	+	R	+
<i>Pediococcus</i> sp.	clusters	+	-	V	V	R	+
<i>Streptococcus</i> sp.	chains	+	V	V	V	S	V

Table references:

Christensen, J J, Vibits, H, Ursing, J, and Korner, B. 1991. *Aerococcus*-like organism, a newly recognized potential urinary tract pathogen. J Clin Microbiol 29:1049-1053.

de la Maza, L M, Pezzlo, Maria, T., Shigei, Janet T., Peterson, Ellena M. 2004. *Aerococcus*, *Abiotrophia* and other miscellaneous gram-positive cocci that grow aerobically, p. 27-32, Color Atlas of Medical Microbiology. ASM Press, Washington, DC.

Facklam, R, and Elliott, J A. 1995. Identification, classification, and clinical relevance of catalase-negative, gram-positive cocci, excluding the streptococci and enterococci. Clin Microbiol Rev 8:479-495.

Kristensen, B, and Nielsen, G. 1995. Endocarditis caused by *Aerococcus urinae*, a newly recognized pathogen. Eur J Clin Microbiol Infect Dis 14:49-51.

Ruoff, K L. 2003. *Aerococcus*, *Abiotrophia*, and other infrequently-isolated aerobic, catalase-negative, gram-positive cocci, p. 434-443. In P. R. Murray, Baron, Ellen Jo, Jorgensen, James H., Tenover, Michael A., Tenover, Robert H. (ed.), Manual of Clinical Microbiology, 8th ed, vol. 1. ASM Press, Washington, DC.

Differentiation of *Aerococcus* species

	LAP	PYR	Bile-esculin	β-Glucuronidase	Lactose	Maltose
<i>A. christensenii</i>	+	-	-	-	-	-
<i>A. sanguicola</i>	+	+	+	+	V	+
<i>A. urinae</i>	+	-	-	+	-	-
<i>A. urinaehominis</i>	-	-	-	+	-	+
<i>A. viridans</i>	-	+	V	V	V	V

Table references:

Facklam, R, Lovgren, M, Shewmaker, P L, and Tyrrell, G. 2003. Phenotypic description and antimicrobial susceptibilities of *Aerococcus sanguicola* isolates from human clinical samples. J Clin Microbiol 41:2587-2592.

Lawson, P A, Falsen, E, Ohlen, M, and Collins, M D. 2001. *Aerococcus urinaehominis* sp. nov., isolated from human urine. Int J Syst Evol Microbiol 51:683-686.

Lawson, P A, Falsen, E, Truberg-Jensen, K, and Collins, M D. 2001. *Aerococcus sanguicola* sp. nov., isolated from a human clinical source. Int J Syst Evol Microbiol 51:475-479.

Ruoff, K L. 2003. *Aerococcus*, *Abiotrophia*, and other infrequently-isolated aerobic, catalase-negative, gram-positive cocci, p. 434-443. In P. R. Murray, Baron, Ellen Jo, Jorgensen, James H., Pfaller, Michael A., Tenover, Robert C. (ed.), Manual of Clinical Microbiology, 8th ed, vol. 1. ASM Press, Washington, DC.

Methods of identification used by laboratories reporting:

Aerococcus urinae

Conventional biochemicals	66
Two or more methods	19
bioMerieux API 20Strep	4
Hardy Strep Quick	3
Dade Behring MicroScan Gram Positive	2
Remel Bactocard Strep	2
Remel RapID STR	2
Test method not indicated	1
16S rDNA sequencing	1
Biolog MicroLog Gram Positive	1
BBL Crystal Rapid Gram Positive	1
TOTAL	102

Aerococcus species

Conventional biochemicals	15
Two or more methods	8
Remel RapID STR	3
Dade Behring MicroScan Gram Pos ID	2
Test method not indicated	1
TOTAL	29

Aerococcus viridans

Dade Behring MicroScan Gram Pos ID	5
Conventional biochemicals	3
bioMerieux API 20 Strep	1
Remel RapID STR	1
Sacks Medical Corp. RefuAH Strep A	1
Two or more methods	1
Test method not indicated	1
TOTAL	13

Gemella morbillorum

bioMerieux Vitek ANI	4
bioMerieux Vitek GPI	3
Dade Behring MicroScan Rapid Gram Positive	2
Conventional biochemicals	1
BBL Crystal Enteric/Nonfermenter	1
Remel RapID STR	1
Two or more methods	1
TOTAL	13

<i>Streptococcus viridans</i> group	
Conventional biochemicals	9
Dade Behring MicroScan Gram Positive	2
bioMerieux Vitek GPI	1
Two or more methods	1
TOTAL	13
<i>Streptococcus acidominimus</i>	
bioMerieux Vitek GPI	4
Two or more methods	3
bioMerieux API 20 Strep	2
Conventional biochemicals	2
TOTAL	11
Alpha hemolytic <i>Streptococcus</i>	
Conventional biochemicals	5
bioMerieux Vitek GPI	1
Dade Behring MicroScan Gram Positive	1
Remel BactiCard Strep	1
Test method not indicated	1
TOTAL	9
No result reported	8
<i>Gemella</i> species	
Conventional biochemicals	4
Test method not indicated	1
Two or more methods	1
TOTAL	6
<i>Gemella haemolysans</i>	
Conventional biochemicals	5
Gram positive cocci	5
Do not process urine cultures	3
<i>Streptococcus viridans</i>	
Conventional biochemicals	3
<i>Aerococcus christensenii</i>	
Two or more methods	1
bioMerieux API 20 Strep	1
TOTAL	2

Alpha hemolytic <i>Streptococcus</i>, not group D	
Conventional biochemicals	1
Two or more methods	1
TOTAL	2
<i>Kocuna rosea</i>	
bioMerieux Vitek ID-GNB	2
<i>Streptococcus</i>, non-beta hemolytic	2
<i>Actinobacillus actinomycetemcomitans</i>	
bioMerieux Vitek NHI	1
Aerobic gram positive cocci	1
Alpha hemolytic gram positive cocci	1
Alpha hemolytic <i>Strep viridans</i> group	
Conventional biochemicals	1
Alpha hemolytic <i>Streptococcus</i> not <i>pneumoniae</i> or <i>enterococcus</i>	
Two or more methods	1
<i>Gemella</i>	
Conventional biochemicals	1
Group D <i>Streptococcus</i>, not <i>enterococcus</i>	
Two or more methods	1
<i>Lactobacillus</i> species	
Two or more methods	1
<i>Lactococcus</i> or <i>Streptococcus</i> species	
Conventional biochemicals	1
<i>Lactococcus</i> species	
Conventional biochemicals	1
<i>Leuconostoc</i> species	
Dade Behring MicroScan Gram Positive	1
<i>Neisseria</i> species	
bioMerieux Vitek API NH	1
Nonpathogenic <i>Streptococcus</i>	
Conventional biochemicals	1

Normal skin flora	
Conventional biochemicals	1
<i>Pediococcus</i> species	
Dade Behring MicroScan Gram Positive	1
<i>Stomatococcus</i> species	
Conventional biochemicals	1
<i>Streptococcus pneumoniae</i>	
Conventional biochemicals	1
Unable to rule out <i>Francisella tularensis</i>	
Two or more methods	1

Chlamydia – cervical swab for direct testing

This simulated cervical swab was provided to laboratories that test for *Chlamydia* using direct detection methods. This proficiency sample was not suitable for *Chlamydia* culture.

This sample was positive for *Chlamydia* and all of the participating laboratories that tested this specimen were able to detect the presence of *C. trachomatis*.

Test kits used by laboratories reporting this specimen as:

Positive for *Chlamydia trachomatis*

Gen-Probe PACE 2 CT or CT/GC	61
BD Probe Tec <i>C. trachomatis</i> assay	15
Gen-Probe Aptima Combo 2	9
bioMerieux Vitek VIDAS	7
Roche Diagnostics COBAS	7
Roche Diagnostics AMPLICOR	5
Beckman Coulter Access <i>Chlamydia</i> EIA	2
Test method not indicated	2
Behring MicroTrak <i>Chlamydia</i> EIA	1
BioRad <i>Chlamydia</i> Microplate EIA	1
Digene Hybrid Capture hc2 CT/NG	1
PCR	1
Wampole MicroTrak <i>Chlamydia</i>	1
TOTAL	113

Direct Antigen Detection

All participating laboratories which perform direct antigen testing received either a simulated throat swab to be tested for Group A *Streptococcus* or a genital swab to be tested for Group B *Streptococcus*. Information provided in the Bacteriology Questionnaire was used to determine which type of specimen to send to each laboratory.

Specimen A - Source: Throat for Group A *Streptococcus*

This specimen was negative for Group A *Streptococcus*. Of the participating laboratories that processed this specimen, 97.6% reported it as negative.

Test kits used by laboratories reporting Specimen A as: Negative for Group A *Streptococcus*

Abbott Signify Strep A	15
B-D Q Test Strep	12
Fisher Healthcare Sure-Vue Strep A	8
Thermo BioStar Aceava Strep A	8
Thermo BioStar A OIA Max	7
Quidel Quick Vue+ Strep A	6
B-D Link 2 Strep A	4
Quidel Quick Vue Inline Strep A	4
Test method not indicated	3
LifeSign Status Accustrep A	2
Remel PathoDx Strep A	2
Applied Biotech Signify Strep A	1
Applied BioTech SureStep Strep A	1
Beckman-Coulter Icon DS Strep A	1
Beckman Coulter Icon SC	1
GenProbe Group A Strep	1
Genzyme OSOM Ultra Strep A	1
Meridian Diagnostics Immunocard Stat Strep A	1
Polymedco Poly Stat Strep A	1
Remel RIM A.R.C. Strep A	1
Sacks Medical Corp. RefuAH Strep A	1
Wampole Clearview Strep A	1
TOTAL	82

Positive for Group A *Streptococcus*

Abbott Signify Strep A	1
Fisher Healthcare Sure-Vue Strep A	1
TOTAL	2

Specimen C - Source: Genital

This specimen was positive for Group B *Streptococcus*. All of the participating laboratories that tested this specimen were able to detect the presence of this organism.

Test kits used by laboratories reporting Specimen C as:

Positive for Group B *Streptococcus*

BioStar Strep B OIA

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BACTERIAL IDENTIFICATION BY PARTICIPATING LABORATORIES

	<u>Number Reported</u>	<u>%</u>
SPECIMEN NUMBER 1		
<i>Shigella sonnei</i>	212	86.2
<i>Shigella</i> species	15	6.1
Do not process stool cultures	13	5.3
No enteric pathogens	4	1.6
Gram negative bacillus	1	0.4
Presumptive <i>Shigella</i> species	1	0.4

SPECIMEN NUMBER 2		
Group A <i>Streptococcus</i>	242	98.4
Do not process throat cultures	3	1.2
Beta hemolytic <i>Streptococcus</i> not group A or B	1	0.4

SPECIMEN NUMBER 3		
<i>Bacteroides thetaiotaomicron</i>	181	73.6
<i>Bacteroides fragilis</i> group	14	5.7
<i>Bacteroides</i> species	12	4.9
Do not process blood cultures	7	2.8
Do not perform anaerobic cultures	7	2.8
<i>B. ovatus/thetaiotaomicron</i>	5	2.0
Anaerobic gram negative bacillus	3	1.2
<i>Bacteroides ovatus</i>	3	1.2
<i>Bacteroides uniformis</i>	3	1.2
<i>Bacteroides caccae</i>	2	0.8
No <i>Bifidobacterium</i>	2	0.8
Not reported	2	0.8
<i>Bacteroides fragilis</i>	1	0.4
<i>Bacteroides ovis</i>	1	0.4
<i>Bacteroides</i> species not <i>fragilis</i>	1	0.4
<i>Prevotella loeschii</i>	1	0.4
<i>Prevotella melaninogenica</i>	1	0.4
<i>Arcanobacterium haemolyticum</i>	200	81.3
<i>Arcanobacterium</i> species	8	3.3
Do not process blood cultures	7	2.8
<i>Arcanobacterium pyogenes</i>	6	2.4
Aerobic gram positive bacillus	5	2.0
Gram positive bacillus	5	2.0
<i>Actinomyces pyogenes</i>	4	1.6
<i>Corynebacterium</i> species	2	0.8
Not reported	2	0.8
Aerobic actinomycetes	1	0.4
<i>Arachnia propionica</i>	1	0.4

Branching gram positive bacillus	1	0.4
Coryneform gram positive bacillus	1	0.4
<i>Listeria</i> species	1	0.4
Pleomorphic gram positive bacillus	1	0.4
<i>Streptococcus milleri</i> group	1	0.4

SPECIMEN NUMBER 4

<i>Staphylococcus aureus</i>	240	97.6
Do not process abscess specimens	4	1.6
Coagulase positive <i>Staphylococcus</i>	2	0.8

SPECIMEN NUMBER 5

<i>Vibrio vulnificus</i>	213	86.6
<i>Vibrio</i> species	14	5.7
Gram negative bacillus	5	2.0
Do not process wound cultures	4	1.6
No growth	3	1.2
<i>Aeromonas hydrophila</i>	2	0.8
No pathogens	1	0.4
<i>Pasteurella multocida</i>	1	0.4
<i>Vibrio fluvialis</i>	1	0.4
<i>Vibrio fluvialis/furnissii</i>	1	0.4
<i>Vibrio mimicus</i>	1	0.4

EDUCATIONAL SPECIMEN

<i>Aerococcus urinae</i>	102	41.4
<i>Aerococcus</i> species	29	11.8
<i>Aerococcus viridans</i>	13	5.3
<i>Gemella morbillorum</i>	13	5.3
<i>Streptococcus viridans</i> group	13	5.3
<i>Streptococcus acidominimus</i>	11	4.5
Alpha hemolytic <i>Streptococcus</i>	9	3.7
No result reported	8	3.3
<i>Gemella</i> species	6	2.4
<i>Gemella haemolysans</i>	5	2.0
Gram positive cocci	5	2.0
Do not process urine cultures	3	1.2
<i>Streptococcus viridans</i>	3	1.2
<i>Aerococcus christensenii</i>	2	0.8
Alpha hemolytic <i>Streptococcus</i> , not group D	2	0.8
<i>Kocuna rosea</i>	2	0.8
<i>Streptococcus</i> , non-beta hemolytic	2	0.8
<i>Actinobacillus actinomycetemcomitans</i>	1	0.4

Aerobic gram positive cocci	1	0.4
Alpha hemolytic gram positive cocci	1	0.4
Alpha hemolytic <i>Strep viridans</i> group	1	0.4
Alpha hemolytic <i>Streptococcus</i> not <i>pneumoniae</i> or <i>Enterococcus</i>	1	0.4
<i>Gemella</i>	1	0.4
Group D Streptococcus, not Enterococcus	1	0.4
<i>Lactobacillus</i> species	1	0.4
<i>Lactococcus</i> or <i>Streptococcus</i> species	1	0.4
<i>Lactococcus</i> species	1	0.4
<i>Leuconostoc</i> species	1	0.4
<i>Neisseria</i> species	1	0.4
Nonpathogenic <i>Streptococcus</i>	1	0.4
Normal skin flora	1	0.4
<i>Pediococcus</i> species	1	0.4
<i>Stomatococcus</i> species	1	0.4
<i>Streptococcus pneumoniae</i>	1	0.4
Unable to rule out <i>Francisella tularensis</i>	1	0.4

CHLAMYDIA SPECIMEN

Positive for <i>Chlamydia trachomatis</i>	113	100.0
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DIRECT ANTIGEN SPECIMEN

A. Negative for Group A <i>Streptococcus</i>	82	97.6
Positive for Group A <i>Streptococcus</i>	2	2.4
C. Positive for Group B <i>Streptococcus</i>	6	100.0